

IV. Factoring Quadratic Trinomials with $a \neq 1$

$$ax^2 + bx + c$$

1. Find 2 numbers whose product is $a \cdot c$ and whose sum is b .
2. Use those 2 numbers from step 1 to split apart the trinomial into 4 pieces
3. Factor by grouping

Example 1: Factor $2x^2 + 17x + 21$

$a=2$ $b=17$ $c=21$

$a \cdot c = 2(21) = 42$

$a \cdot c$	b
42	17
6, 7	
42, 1	
<u>14, 3</u>	17 ✓
21, 2	

$2x^2 + 14x + 3x + 21$

$2x(x+7) + 3(x+7)$

$(2x+3)(x+7)$

Example 2: Factor $3x^2 + x - 2$

$a=3$ $b=1$ $c=-2$

$a \cdot c = 3(-2) = -6$

$a \cdot c$	b
-6	1
-6, 1	-5
6, -1	5
-3, 2	-1
<u>3, -2</u>	1

$3x^2 + 3x - 2x - 2$

$3x(x+1) - 2(x+1)$

$(3x-2)(x+1)$